Trend Study 14-5-99

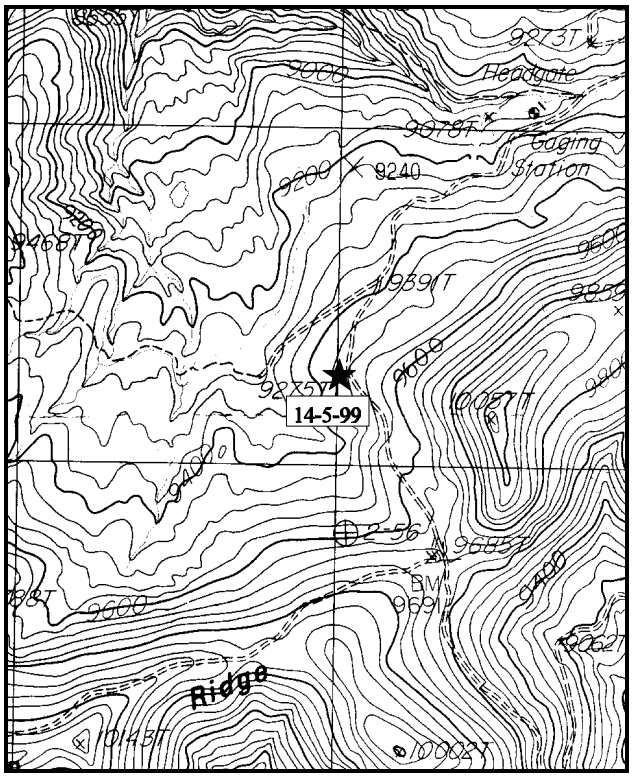
Study site name: Jackson Ridge . Range type: Dry Meadow .

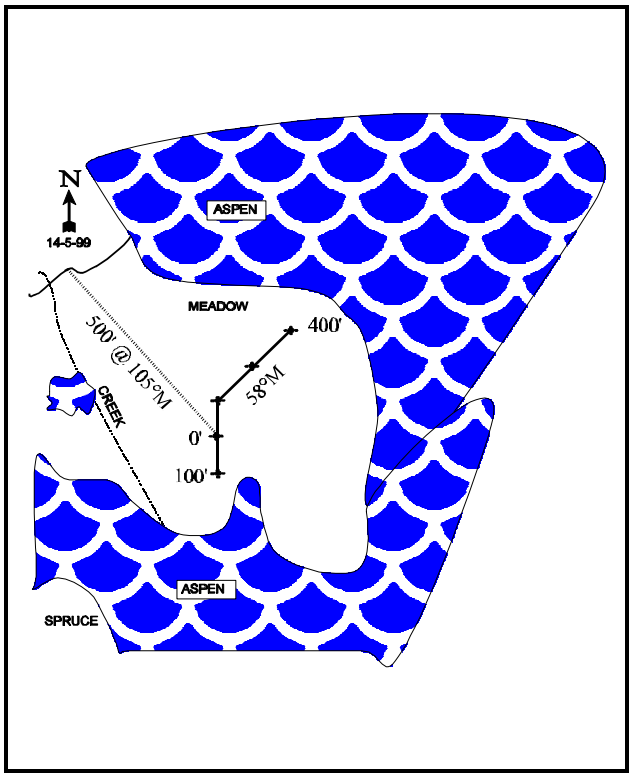
Compass bearing: frequency baseline 180°M.

Footmark (first frame placement) 5 feet, footmarks frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the junction of the Blue Mountain Road and the North Creek-Indian Creek Road (just west of Dalton Springs campground), go 7.25 miles to Indian Creek. From the crossing, continue 0.55 miles to a fork. Stay left on the main road. Continue 0.05 miles to another small fork to the right. Go down this jeep trail(F.S. Road 18) 0.3 miles to a sharp right bend in the road near a small stream. Stop here and walk southeast (120/) up the clearing for 490 feet. The 0-foot baseline stake is a 4-foot tall green fence post with browse tag #479 attached.





Map Name: Mt. Linnaeus Diagrammatic Sketch

Township 34S , Range 22E . , Section 9 UTM 4188194.262 N, 630895.866 E

DISCUSSION

Trend Study No. 14-5 (35-5)

The Jackson Ridge Study samples a moderately steep meadow clearing in an aspen- spruce-fir forest on the headwaters of Indian Creek in the southern part of the Abajo Mountains. Because of an underground aqueduct moving water from this drainage, this area is considered part of the Blanding municipal watershed. Consequently, cattle grazing is not permitted on this part of the Manti-LaSal National Forest. However, fences are in poor repair and allow cattle to trespass from the Camp Jackson allotment. Fresh cow sign was abundant on the study site in August 1986, when the site was first established. Deer use the area, but no elk sign was observed in 1986 or 1994. Pellet group data from 1999 estimate 2 deer days use/acre (5 deer days use/ha) and 12 elk days use/acre (30 elk days use/ha). All of the pellet groups were found further up the slope were it is more open.

The high elevation (9,400 feet) of the site limits season of use from late spring to late fall. Water is not a limiting factor, even the small stream flowing northwest down the slope towards Indian Creek (perennial) contains water late in the year. Annual precipitation is at least 20 inches per year. The study site has a western exposure, with a 35% slope.

The soil is a moderately deep clay loam with an estimated effective rooting depth of almost 16 inches. The upper soil horizon is a fine textured, heavy soil with a good amount of organic matter. There is quite a bit of large rock in the profile, concentrated in the top 8 inches of soil. In some areas, rock has been exposed by erosion, which occurred in the past and has led to heavy soil loss and the formation of deep gullies. However, now the soil has good vegetative and litter cover which provides excellent soil protection. The gullies are stabilized and recovering and there is only a small amount of rill erosion on the steeper faces. Mounds of bare soil are the result of recent rodent activity.

Surrounding the small meadow is a thick forest of quaking aspen, Engelmann spruce, white fir, and Douglas fir. The forest provides excellent cover for big game. There are young trees on the edge, with aspens being the most aggressive in moving into the meadow. These young trees showed moderate to heavy use on all available portions of the plants in 1986. Many of the young trees were largely unavailable. The smallest ones often had reduced numbers of yellowish leaves, with many being classified in poor vigor in 1986. Browsing may be heavy enough to limit or slow the spread of aspens into the meadow. All mature aspen in the meadow are unavailable due to height. Aspen was mistakenly not included in the shrub density strips in 1994, so no comparisons can be made with 1986 and 1999 data. Density is currently (‘99) slightly higher (620 to 532 trees/acre) than 1986 estimates, but some of the change is due to the lengthening of the baseline in 1994. Overhead canopy cover of aspen was estimated at 21% in 1999. Utilization appeared light. Snowberry occurs infrequently in the meadow with some showing light browsing.

The bulk of available forage production on this study site comes from the herbaceous component which currently (‘99) provides 96% of the vegetation cover. There are several native grasses on the site but the most abundant species is Kentucky bluegrass which accounted for 75% of the total grass cover in 1994 and 81% in 1999. Other common grasses include slender wheatgrass, orchard grass, and letterman needlegrass. A large species of *Carex* was found in scattered bunches. The abundance of forbs on the site is an especially important component of this summer range. In summer, forbs constitute a large portion of the deer diet (up to 50% and more). Many valuable and palatable species are common, including thickleaf peavine, American vetch, mountain dandelion, silvery lupine, sweetroot, and wild strawberry. To illustrate how dominant the forbs are on the site, they made up 66% of total vegetative cover in 1994 and 60% in 1999.

1986 APPARENT TREND ASSESSMENT

The key species to monitor here are the young increasing aspens and the forbs. The area is healthy, diverse and provides abundant forage. Although cattle grazing is rather concentrated and apparently unregulated, there is plenty of herbaceous forage. The young aspens are heavily utilized where available, but will probably continue to slowly increase. Overall vegetative trend is stable. With increased vegetative and litter cover and organic matter content, the soil is stabilizing and trend is improving.

1994 TREND ASSESSMENT

Soil trend would be considered improving because percent bare ground has gone from 11% down to only 4% and the herbaceous understory makes up 97% of the total vegetative cover. The browse trend is improving with the quaking aspen not showing signs of poor vigor as was the case in 1986. However, browse only contribute to 1% of the total vegetative cover on this site. There was a slight drop in the nested frequency value for the grasses, but this was more than compensated for with significant increases in the forbs which produces almost 70% of the herbaceous understory cover. Trend for the herbaceous understory is up.

TREND ASSESSMENT
soil - improving
browse - improving, but only contributes 1% of total vegetative cover
herbaceous understory - up, with the large increase in forbs

1999 TREND ASSESSMENT

Trend for soil remains stable with similar ground cover characteristics compared to 1994 estimates. Browse is not very important on this summer range as shrubs and trees are not abundant in this meadow. However, aspen appears to be stable. The increase in density since 1986 is likely due to the much larger sample used in 1994 and 1999. Snowberry also shows a steady increase since 1986 with some moderate use apparent in 1999. However, snowberry provides less than ½ of 1% cover on the site. Trend for browse is considered stable. Trend for the herbaceous understory is stable with similar sum of nested frequency values for grasses and forbs compared to 1994 estimates. Cover of grasses and forbs are up slightly, but frequency values are basically the same. The increased cover of forbs is likely due to the early reading of the site (6-15) in 1999. Kentucky bluegrass remains the dominant grass by providing 81% of the grass cover. Dominant forbs include: western yarrow, larkspur, thickleaf peavine, lupine, tuber starwort, and dandelion. These six species account for 85% of the forb cover and 53% of the total herbaceous cover. Of these dominant forbs, only larkspur and thickleaf peavine have increased significantly in nested frequency since 1994.

TREND ASSESSMENT
soil - stable
browse - stable but unimportant
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'99	'86	'94	'99	'94	'99
G	Agropyron spicatum	$_{b}$22	$_{a}$-	$_{a}$-	6	-	-	-	-
G	Agropyron trachycaulum	$_{b}$104	$_{a}$68	$_{a}$55	45	30	31	.94	.62
G	Bromus inermis	$_{a}$48	$_{b}$19	$_{b}$8	20	9	3	.27	.21
G	Carex spp.	$_{A}$5	$_{b}$21	$_{ab}$7	2	8	4	.43	.07
G	Dactylis glomerata	$_{a}$3	$_{a}$9	$_{b}$28	1	4	11	.19	1.12
G	Phleum pratense	1	-	4	1	-	1	-	.03
G	Poa pratensis	$_{b}$362	$_{a}$341	$_{ab}$357	95	96	99	8.45	13.86
G	Stipa lettermani	$_{ab}$48	$_{a}$45	$_{b}$76	22	18	32	.24	1.25
G	Trisetum spicatum	$_{b}$4	$_{b}$8	$_{a}$-	3	3	-	.66	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		597	511	535	195	168	181	11.20	17.17
Total for Grasses		597	511	535	195	168	181	11.20	17.17
F	Achillea millefolium	280	291	286	91	91	91	6.55	9.22
F	Agoseris glauca	$_{b}$37	$_{ab}$23	$_{a}$13	20	14	6	.10	.05
F	Androsace septentrionalis (a)	-	$_{a}$36	$_{b}$55	-	16	23	.08	.21
F	Arabis spp.	$_{A}$-	$_{ab}$1	$_{b}$10	-	1	4	.00	.07
F	Cerastium arvense	$_{a}$-	$_{b}$10	$_{a}$-	-	5	-	.02	-
F	Chenopodium album (a)	-	2	-	-	1	-	.00	-
F	Cirsium wheeleri	$_{a}$6	$_{ab}$10	$_{b}$24	2	4	10	.02	.49
F	Conioselinum scopulorum	$_{a}$-	$_{b}$11	$_{a}$-	-	4	-	1.32	-
F	Delphinium nuttallianum	$_{a}$-	$_{b}$78	$_{c}$190	-	38	77	.21	2.13
F	Erigeron engelmannii	$_{b}$10	$_{b}$10	$_{a}$-	3	4	-	.09	-
F	Erigeron flagellaris	102	96	52	35	42	29	.55	.29
F	Erigeron speciosus	$_{ab}$10	$_{b}$24	$_{a}$2	5	11	2	.52	.06
F	Fragaria vesca	39	15	18	13	5	8	.24	.55
F	Galium bifolium (a)	-	9	16	-	3	8	.01	.21
F	Gentiana amarella heterosepala	$_{b}$9	$_{b}$8	$_{a}$-	3	3	-	.01	-
F	Lathyrus lanszwertii	$_{a}$16	$_{a}$40	$_{b}$92	5	16	39	1.56	2.41
F	Lupinus argenteus	$_{a}$32	$_{b}$92	$_{b}$122	17	40	53	1.64	2.38
F	Mertensia brevistyla	-	3	-	-	1	-	.03	-
F	Microsteris gracilis (a)	-	1	-	-	1	-	.00	-
F	Orthocarpus spp. (a)	-	$_{a}$-	$_{b}$7	-	-	3	-	.04
F	Osmorhiza occidentalis	37	25	27	14	10	11	.53	.28
F	Phacelia hastata	$_{b}$23	$_{a}$4	-	10	2	-	.03	-
F	Phlox longifolia	3	-	-	1	-	-	-	-
F	Polygonum douglasii (a)	-	$_{b}$49	$_{a}$15	-	22	6	.11	.13
F	Potentilla gracilis	$_{b}$9	$_{b}$10	$_{a}$-	4	3	-	.18	-
F	Ranunculus spp.	$_{A}$-	$_{b}$55	$_{a}$47	-	28	23	.19	.30

Type	Species	Nested Frequency '86	Nested Frequency '94	Nested Frequency '99	Quadrat Frequency '86	Quadrat Frequency '94	Quadrat Frequency '99	Average Cover % '94	Average Cover % '99
F	Senecio neomexicanus	$_{a}$29	$_{b}$73	$_{b}$95	14	35	43	.64	.57
F	Stellaria jamesiana	$_{a}$-	$_{b}$227	$_{b}$204	-	80	72	2.57	2.82
F	Taraxacum officinale	$_{a}$168	$_{b}$215	$_{b}$208	70	80	80	3.09	5.08
F	Thermopsis montana	$_{a}$-	$_{b}$68	$_{a}$-	-	27	-	.51	-
F	Thlaspi montanum	$_{a}$22	$_{b}$62	$_{b}$73	12	27	35	.18	.35
F	Tragopogon dubius	17	16	7	10	7	4	.66	.02
F	Unknown forb-perennial	$_{b}$96	$_{a}$-	$_{a}$-	43	-	-	-	-
F	Valeriana occidentalis	7	5	-	2	2	-	.30	-
F	Veronica serpyllifolia	1	-	-	1	-	-	-	-
F	Vicia americana	$_{b}$145	$_{b}$165	$_{a}$98	62	62	44	1.82	.64
F	Viola canadensis	$_{a}$-	$_{b}$4	$_{ab}$6	-	3	2	.04	.01
Total for Annual Forbs		0	97	93	0	43	40	0.21	0.59
Total for Perennial Forbs		1098	1641	1574	437	645	633	23.70	27.76
Total for Forbs		1098	1746	1667	437	693	673	24.11	28.36

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 14 , Study no: 5

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Picea engelmannii	0	2	.03	.07
B	Populus tremuloides	0	19	.79	1.43
B	Pseudotsuga menziesii	0	0	-	.01
B	Symphoricarpos oreophilus	2	5	.53	.42
Total for Browse		2	26	1.16	1.94

CANOPY COVER --
Herd unit 14 , Study no: 5

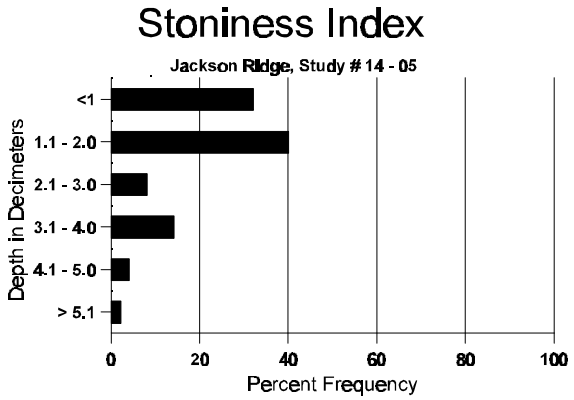
Species	Percent Cover '99
Populus tremuloides	21

BASIC COVER --
Herd unit 14 , Study no: 5

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '86	Average Cover % '94	Average Cover % '99
Vegetation	383	386	25.50	38.06	49.25
Rock	200	151	6.50	8.04	7.12
Pavement	6	97	1.75	.01	.44
Litter	390	395	55.00	44.68	67.18
Cryptogams	18	47	0	.06	.64
Bare Ground	150	144	11.25	3.96	4.85

SOIL ANALYSIS DATA --
Herd Unit 14, Study # 05, Study Name: Jackson Ridge

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.5	44.8 (15.9)	6.0	36.9	34.6	28.6	5.3	15.6	390.4	0.3



PELLET GROUP DATA --
Herd unit 14 , Study no: 5

Type	Quadrat Frequency '94	Quadrat Frequency '99
Moose	5	-
Elk	-	7
Deer	1	1

Pellet Transect Days Use/Acre (ha) '99
N/A
11 (27)
1 (2)

BROWSE CHARACTERISTICS --
Herd unit 14 , Study no: 5

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Picea engelmannii																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
Y	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)					
	'86	33	Dec:		-
	'94	0			-
	'99	40			-

Populus tremuloides																		
S	86	1	4	5	-	-	-	-	-	-	6	-	2	2	333			10
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	1	1	-	1	2	4	4	-	-	8	-	2	3	433			13
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	86	-	-	-	-	-	-	-	1	-	1	-	-	-	33	393	300	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	24	-	24	-	-	-	480	-	-	24
D	86	1	1	-	-	-	-	-	-	-	-	-	2	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	25%	25%	44%	
'94	00%	00%	00%	
'99	00%	74%	00%	

Total Plants/Acre (excluding Dead & Seedlings)					
	'86	532	Dec:		12%
	'94	0			0%
	'99	620			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pseudotsuga menziesii																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	0	Dec:		-
'94	0			-
'99	0			-

Symphoricarpos oreophilus																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	1	-	-	-	-	-	-	-	1	-	-	-	33	24	2	1
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	23	101	3
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120	18	32	6
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	2	-	2	-	-	-	-	-	2	-	2	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	100%	00%	00%	+45%
'94	00%	00%	00%	+75%
'99	17%	00%	17%	

Total Plants/Acre (excluding Dead & Seedlings)			
'86	33	Dec:	0%
'94	60		0%
'99	240		33%